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ABSTRACT

Biofeedback is the use of sensitive detectors (instruments) with visual and auditory displays to reveal to an individual minute changes in his internal physiological functions. Biofeedback training with such instruments results in the ability to voluntarily regulate physiological functions formerly believed involuntary. These physiological functions are correlates of psychological states and processes. Hence, psychological self-regulation, self-awareness, and enhancement (psychological health) are outcomes of biofeedback training for voluntary self-regulation of physiological functions. This paper presents a brief introduction to biofeedback instruments most frequently used in counseling; to counseling applications, outcomes, and cautions; and presents a rationale for counseling via biofeedback training. (Author)

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AN INTRODUCTION TO APPLICATIONS OF BIOFEEDBACK TRAINING IN COUNSELING

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INTRODUCTION

We are primarily responsible, as individuals, for our own mental and physical health or illnesses. Most of our ineffective functioning, illnesses and even deaths result from stress-related disorders --- from our maladaptive tension-inducing reactions to daily life. We see this most obviously in such symptoms as ulcers, migraine and tension headaches, asthma, insomnia and lack of energy. Research suggests that at least 50 to 80 per cent of human problems are psychosomatic, resulting from the body's unconscious reaction to psychological stress. Such stress reactions are present, but less obvious, in the inability to concentrate, depressions and anxieties, lowered self-esteem and self-confidence, ineffective interpersonal behaviors and ineffective decision making. We, as individuals, are responsible.

We individually can learn to free ourselves from these habitual, conditioned responses and from our dependency on external factors and persons in our environment. However, our traditional treatments too frequently are inadequate for such re-learning. Innoculations don't prevent such stress-related reactions. Medications simply alleviate the symptoms. To delve into life histories seeking previous causes of such maladaptive responses is informative, but does not necessarily result in the re-learning needed to free ourselves from habitual responses and dependencies.

New training methods are indicating that human beings can themselves learn to exert voluntary self-regulation over most of their own mental and emotional reactions and states and over most physiological processes. And a correlate of learning such voluntary control is voluntary choice. Individually, we can choose to alter and direct ourselves in ways we desire or remain feeling that we are the victims of our bodies and environment.

Biofeedback, as one of these emerging techniques, has major implications for understanding and treating human mental, emotional and physical problems. Training in voluntary self-regulation via biofeedback can serve as a primary tool or treatment in preventive mental health and in enhancing latent human capacities.

What is Biofeedback?

Biofeedback is the use of sensitive detectors with visual and auditory displays to reveal to an individual minute changes in his internal physiological functions. An electronic instrument detects and amplifies a signal from such physiological functions as muscle tension, temperature, heart rate or brain waves. This is "fed back" to the person by visual (meters, lights) and auditory (tones, clicks) displays, so the person can "watch" the minute changes.

Biofeedback training is learning voluntary self-regulation of a specific physiological process with the aid of this immediate and objective information. With such training, a person learns the process of voluntary self-regulation of these normally involuntary functions. One can, if desired, monitor sensitively the internal orchestra of minute physiological changes and choose to enhance a multitude of processes and states.

Research has demonstrated that, with biofeedback training, persons can learn increased self-regulation of such processes as heart rate, blood pressure, muscle tension, hand temperature, brain wave rhythms, galvanic skin response, salivation rate, simultaneous voluntary control of forearm muscle tension, hand temperature and alpha brain wave rhythm. This research suggests that, at least theoretically, virtually every physiological function that can be monitored can be regulated to some degree. All that is needed are instruments to detect, amplify and feed back instantaneously signals from physiological processes, and practice with such feedback.

Behavioral Correlates of Physiological Self-Regulation

Of special interest to counselors, therapists and educators is biofeedback research demonstrating that learning voluntary self-regulation and enhancement of psychological states and responses accompanies voluntary control of physiological functions. For example, feedback training to voluntarily increase hand temperature lower tension levels in the frontalis (forehead) muscle, for smoother and more regular breathing, or to increase brain waves in the 4-13 cycles per second

range all seem to result in reports of alleviation of symptoms, in more effective functioning and increased self-esteem.

Such research suggests a psychophysiological principle: "Every change in a physiological state is accompanied by an appropriate change in the mental-emotional state, be it conscious or unconscious· and, conversely, every change in the mental-emotional state, conscious or unconscious, is accompanied by an appropriate change in the phsyiological state" (Green, Green and Walters, 1970)

In summary: (1) Biofeedback training results in the ability to voluntarily regulate physiological functions formerly believed involuntary, (2) physiological functions are correlates of psychological states and processes, and (3) psychological self-regulation, self-awareness, and enhancement (psychological health) is an outcome of biofeedback training for voluntary self-regulation of physiological functions.

Instruments

The following are brief descriptions of four biofeedback instruments frequently used in counseling and therapy. A longer discussion of the temperature feedback instrument is presented to illustrate the relationship between psychological and physiological processes. We have found the temperature trainer to be the easiest instrument for persons to understand (the physiological processes monitored and the instrument) and to be very versatile. A reliable, sensitive temperature feedback instrument is among the less expensive biofeedback equipment.

Temperature Feedback. A typical temperature feedback instrument displays, on a meter, temperature changes on the surface of the skin. Most temperature feedback instruments are so sensitive that changes of as little as one-tenth of a degree (0.1) result in significant movement of the meter needle, permitting feedback of minute changes. Such sensitivity is necessary for effective biofeedback training. Typically, temperature is detected by a thermister (sensitive to changes in temperature) attached to the middle of the finger-print of the middle finger on the dominant hand.

Research has shown that one of the physiological correlates of stress is a change in blood flow to the extremeties (hands and feet). The temperature feedback instrument directly monitors the surface temperature of the finger. This reflects the volume (amount) of blood in the finger, which, in turn, is related to the level of stress. As a person becomes more stressed and reacts (even slightly) to a situation or thought, a "shunting" mechanism is activated. This is accentuated as one's level of activation builds through the day. Blood flow to the extremeties is restricted and is increased in the central portion of the body to aid the increased alertness (to briefly describe the fight-flight reaction, an appropriate response to physical threat, but detrimental in the intellectual, social and personal situations of daily "civilized" life). As tension is reduced (even slightly) there is a dilation of blood vessels (even minute) and increased blood flow to the extremeties, thus increasing the skin surface temperature in the fingers. This displayed physiological function, then, provides nearly direct feedback of our psychological reaction. And, this physiological response is much more rapid than most realize.

The temperature feedback instrument helps one become aware of this sensitive sensory and monitoring system which already exists within a person. The feedback instrument does this by showing on a meter the minute fluctuations of the surface skin temperature in tenths of a degree. By practicing with this instrument, a person gradually becomes more conscious or aware of the slight changes associated with this bodily process. So, as attention is directed inward and internal awareness is related to increases in skin surface temperature, a person can compare and contrast what is felt with what the meter is reading. Through trial and error, one can learn to filter out from the wealth of internal cues, those to manipulate to voluntarily regulate his mental, emotional and physiological responses, eventually without aid from the instrument.

Electromyograph (EMG). Muscles vary in an electrical potential, with increases

and decreases corresponding to the level of muscle tension. This electrical signal is measured in microvolts (millionths of a volt). The usual EMG feedback instrument detects and amplifies these changes in electrical potential and instantaneously presents changes on a meter or by changes in the pitch of a tone or frequency of clicks.

Typically, surface electrodes are placed on the frontalis (forehead) muscle. This muscle seems a crucial barometer of tension in persons, though most are not aware of it until the level of tension is relatively high. Some biofeedback practicioners initially train for forearm extensor muscle level to below about 3 microvolts before moving to frontalis feedback training.

As described with temperature, EMG feedback training is directed at becoming more aware of the internal, psychological feelings and sensations associated with changes in this sensitive, sensory, physiological muscle monitoring system.

Galvanic Skin Response (GSR). Another indicator of physiological stress reactions is the skin's electrical resistance -- which increases and decreases as stress goes up and down. This change is reflected by the Galvanic Skin Response (which actually is a measure of sweat gland activity), and can be fed back by changes in the pitch of a tone or meter reading. GSR readily responds to such irrelevant factors as deep breathing, body and hand movements and coughing. Most good manuals accompanying GSR instruments describe procedures for identifying psychologically relevant GSR responses.

Electroencephalograph (EEG). Electrodes attached to the surface of the scalp pick up a continuous output of electrical signals, measured in microvolts. A record of these signals is called an electroencephalograph (EEG).

This signal is a continuous wave which varies in frequency and amplitude. Frequency is measured in Hertz (Hz, or cycles per second). Several frequencies may appear simultaneously, with the one of highest amplitude called the dominant frequency (the frequency most often referred to and fed back in EEG feedback). Amplitude is the intensity or strength of the signal and corresponds to the height of the EEG.

The EEG traditionally has been divided into four major frequency bands, often called brain wave rhythms. Mentioned very briefly are some psychological or behavioral correlates associated with these bands or rhythms, though there are individual differences.

Beta (above 13 H_z) -- external focusing of attention, alert, concrete problem solving, anxiety.

Alpha (8-13 H_z) -- internal focusing of attention, passive alertness, pleasant.

Theta (4-8 H_z) -- drowsiness, dropping into sleep, reverie associated with hypnogogic-like imagery.

Delta (less than 4 H_z) -- normally in deep, non-dreaming sleep.

A basic EEG feedback instrument amplifies and filters this signal from the scalp and gives auditory feedback when a given rhythm is present. If the instrument is set for alpha feedback, a tone comes on for as long as any frequency 8 to 13 H_z is present in the EEG of the trainee. Some instruments have fixed filters (set for 8-13 H_z for alpha and/or 4-8 H_z for theta) others have adjustable band-pass filters. A few EEG feedback instruments have visual displays for per cent time a given frequency is present, for average frequency and for average amplitude. If money is available, we would recommend purchasing EEG instruments with continuously adjustable filters, to aid in shaping average frequencies towards the theta range during training.

Some persons use monopolar electrode placements (one electrode on the surface of the scalp and the other two attached to ears, usually). Others use bi-polar set-ups (2 active electrodes on scalp). We have used both and prefer monopolar.

Use an electrode placement in the left occipital (for monopolar) or left occipital-temporal (bi-polar) when just getting into EEG feedback training. There's much discussion about the type of electrodes and metals used in them. We've heard

experts say that the inexpensive electrodes do about as well, and that's our experience (unless doing precise research).

Biofeedback in Counseling

The brief descriptions below are just to spark your thinking about ways you might integrate biofeedback into your counseling. There are nearly as many ways as there are mental health professionals using biofeedback. We strongly encourage you to study, attend workshops, train with instruments yourself and, then, develop applications of biofeedback in ways congruent with you.

Temperature Feedback during Counseling. Physiological feedback can easily be incorporated into your counseling by routinely attaching clients to a temperature feedback instrument during counseling sessions. To mention only one example of dozens: While talking about how something really does not bother him, the client's temerpature is decreasing, indicating incongruence between the client's psychological report and the physiological feedback. This physiological feedback to the client of his increased tension (reflecting increased anxiety) helps him become more aware that what is being discussed really is a psychological concern. This often results in immediate exploration and insights which normally would come much slower. The finger temeprature is much more rapid and sensitive than most counselors realize. GSR devices also have been used this way.

Such immediate, objective physiological feedback directly to the client and counselor indicate the accuracy of the client's psychological reports. (We not too facetiously call this a "truth indicator.") With such feedback, the client already is beginning to learn more sensitive internal awareness and practice voluntary self-regulation. Continued experience can result in giving clients a more active role in treatment. Additionally, counselors can begin to appreciate the potentials of biofeedback training.

Diagnosis with Temperature Feedback. Another use of immediate physiological feedback for more accurate psychological understanding is with diagnosis. One

colleague gives incomplete sentence blanks orally, with clients attached to temperature feedback. The preponderance of responses by one client were of physical complaints and body image, but accompanied by virtually no change in temperature. Temperature decreased before and during responses to just two items, both regarding men. The counselor ignored the most frequent response category and began (during this diagnostic interview) exploring the psychological area accompanied by the greatest physiological reaction. He reported progress during this first interview equivalent to several normal sessions.

Desensitization. EMG feedback is being used during desensitization. With this addition, both counselor and client can recognize increased tension sooner, as anxiety-producing situations are imagined. Some counselors have used temperature feedback successfully, rather than EMG. Clients can learn relaxation by instrument feedback practice, more or less on their own, without the counselor having to take time to teach relaxation exercises.

Biofeedback Training as Counseling. Biofeedback training is available as a service in the Counseling Center at Kansas State University. Biofeedback training is offered as a two-part program. The first part is called a "Two-Week Intensive Introduction". The second part consists of four-week training segments for which participants contract.

Many of the participants in biofeedback counseling seek involvement because of the recommendation of a friend. Others are referred by counselors and, occasionally, by a campus physician or psychiatrist. We take no case histories and do not identify problems. Our focus is on health -- on the self-awareness participants are learning, on the voluntary self-regulation they practice and on applications in daily life.

As a result of this variety in participant motivations, we developed the Two-Week Intensive Introduction (TWII) as an experiential trial period.

The first week of the TWII the participants practice, as a group, with Jacobsen's Progressive Relaxation exercises from a pre-recorded tape. Pre and post hand temperatures are taken with a simple household thermometer attached to a finger.[1] The thermometers show gross changes that let the participants see what has taken place as a result of their relaxation.

The second week of the TWII is individual practice with either temperature or EMG feedback. The participant chooses the instrument during an initial introductory session to both instruments. We suggest they start with the instrument on which they can effect the greatest change.

At the end of the TWII, the participants choose whether or not to continue training. Those deciding to continue sign a contract agreeing to (1) practice three times a week with biofeedback instruments in the Center, (2) practice away from the Center, without instruments, what they are learning about themselves from instrument feedback, and (3) meet once a week in a small group with other participants to discuss what they are learning. As part of the weekly meetings, the participants negotiate, in dyads, reasonable objectives for their training application. Contracts and objectives are re-negotiated for succeding four week segments.

Participants move from EMG and temperature feedback training to alpha and theta brain wave feedback practice for lowering their average frequency towards the theta range and increasing their theta production. Some of the psychological correlates of enhanced theta are increased self-insights, personality integration, and, for some, 20 minutes of theta practice is similar to a two-hour sleep.

All individual training sessions are 30-50 minutes long. At the end of practice, participants fill out a log describing the experience and a graph depicting changes. A counselor or paraprofessional trained in biofeedback discusses with each participant, for several minutes during or after practice, what is being experienced and how to apply it during the day, away from the Center.

[1]Available from John L. Chaney Instrument Com. P. O. Box 72, Lake Geneva, Wis. 53147 $27.15 f.o.b. for a lot of 100 (Minimum order).

The major focus of the individual and group contacts is on helping participants express the awarenesses and the changes they are experiencing. These insights and changes frequently are of the "little" things indicative of increasing self-regulation and from which major changes come. We constantly encourage integration into daily life of the skills and awarenesses being learned.

The environment of the biofeedback training area is such that what is learned in training can be easily integrated into daily life. The practice area is a well-lighted, hard-wood floored office area with conventional chairs for seven to eight persons to practice simultaneously. Persons are coming and going all the time, with phones ringing and frequent conversations. So achievement of comfortable relaxation in the training setting is more realistic for actual situations in life than practice in a secluded, dimly-lit setting.

Outcomes

Reports of experiences of persons who have been in this program are described very briefly. For more detail, see Danskin and Walters (1975). Our outcomes are congruent with several biofeedback colleagues who have the same emphasis on health.

Getting Settled. Biofeedback counseling is new to most persons, so many take two or three sessions to get comfortable with the instruments.

External to Internal. In early sessions, frequent comments are made to what "that instrument" is or is not doing -- "That blasted temp machine wouldn't go up today!" This is natural, as most of us would rather externalize -- put the responsibility "out there" on some other thing or person. So, you need to remind persons to focus internally. After all, "that instrument" is just a mirror reflecting back what is happening inside a person.

Body Tensions. Initial reports frequently are of an awareness of bodily tensions. A few report this as frustrating (they are more aware, but still have to learn how to decrease tensions). We help them see that this is progress -- one has to become aware of something to be able to do something about it). With continued practice comes increasing self-regulation of physical tensions.

Psychological Processes. Increased awareness of psychological (mental-emotional) processes accompany and/or follow along with increased self-regulation of physical tensions. Persons get in touch with the beginning reactions, alter them and report such as increased concentration, improved interpersonal relationships or exam-taking performance or better sleep.

Symptom Relief. Frequent reports are of the gradual disappearance of symptoms such as biting finger nails, feelings of abandonment, sometimes speech impediments or the need to get "high" on drugs.

Self-confidence and Self-esteem. Increased self-confidence and enhanced self-esteem are common outcomes. This, to us, is most rewarding and most difficult to verbalize. As participants begin seeing themselves as being able to regulate and direct their own mental, emotional and physiological processes, as they see themselves more in charge, they report significant increases in confidence and self-regard. This needs to be experienced to be appreciated.

Integrative Processes. Extended practice often is accompanied by integrative experiences in the lives of participants. To pick just a few phrases from more extended reports: "I feel so put together." "I feel as if I have my head screwed on right for the first time." "Biofeedback has meant a whole new way of life for me."

Hypnogogic-Like Imagery. A correlate of deeply-relaxed, internally-directed states frequently is imagery of many types, from colors or weightlessness to spontaneous re-living of previous experiences. This sometimes comes as a surprise, so there is need for assurance that such experiences are a natural part of becoming aware of onesself. Also, such experiences can be related to the past, present or to the future real world. These can result in a resolution by the participant, without the struggle often associated with intensive therapy. Some participants will need to talk through the meaning of such imagery.

P.S. Generally, biofeedback training has been and is a learning experience for us. This paper is just a brief attempt to communicate some of the basics of biofeedback training as counseling.

How Does This Happen?

Though the exact explanation has not been worked out, the following has been advanced:

> "According to neuroanatomists, the subcortex of the brain contains a neural network called the limbic system that responds to emotions. Whenever we 'have an emotion' the electrical activity of the limbic system changes. This system, however, is linked by many nerve fibers to other sections of the subcortex which contain the neural circuits that control most of the body's involuntary, or autonomic, functions. The exact neural pathways have not yet been traced, but this much seems certain: If we have a thought that is associated with a feeling (and few thoughts are not), the limbic system, through its connections with various control circuits, brings about unconscious changes in some of the body's involuntary functions."
>
> "Whatever the exact explanation, the important fact is that if we use a sensitive detector and visual and auditory displays to reveal minute physiological changes, we often can learn to control the sections of the involuntary system that regulate these changes. Theoretically, at least, we should be able to bring under control all our physiological processes with this technique" (Green and Green, 1974, p. 141).

Cautions

What are the negative outcomes of biofeedback training? None, so far as we can determine. For several years, we've been checking with other professionals at biofeedback conferences and workshops and have been monitoring our own biofeedback training program. The consensus seems to be that few, if any at all, adverse results have occurred in individuals using biofeedback.

Inaccurate Instruments. Some commercially available instruments are poorly designed and do give inaccurate feedback. Eye-blink and eye-movement artifacts, for example, could be detected erroneously as brain-wave rhythms in some poorly constructed instruments. We'd encourage having access to standard electronics test equipment to determine instrument accuracy. Our experience is that if you begin asking around for such assistance, you'll find it.

Medical Precautions. With persons with medical problems, it is advisable for their physician to be monitoring the problem and medication during biofeedback

training for two primary reasons. First, an associated underlying organic pathology could go undetected. An example would be a person seeking biofeedback training for migraine headaches which could be related to some organic pathology. Second, requirements for medications may vary (often decrease) and drug levels may need to be readjusted with continued biofeedback training.

Feelings Associated with Imagery. Persons achieving deeply, unstressed, internal states with biofeedback training sometimes report feelings of weightlessness, sensations of tumbling in space and other occasionally ambiguous experiences. Also, some report re-living previous experiences, having new insights or archetypical imagery. Such experiences frequently come as a surprise. We feel it is essential that a knowledgeable person be available to discuss and help put these in proper perspective. Such experiences seem a natural part of becoming more deeply aware of oneself and evidences of progress in biofeedback training.

Getting Started

We suggest this sequence: (1) study biofeedback literature, (2) attend a workshop, (3) train, yourself, with instruments, (4) train a few select colleagues and clients, (5) develop uses of biofeedback training in your counseling.

Study Biofeedback Literature. Very little has been written specifically about applications in counseling, though articles are beginning to appear. (The low publication rate for practioners holds in this area, too.) Learn to read biofeedback articles with an eye to reports of psychological correlates (often reported incidentally). Also, get your own informal network going, as we have, by not being shy about using the phone and mails any be attending workshops and meetings. You will find in the Appendix a listing of a bibliography and major books, along with the address of the professional organization.

Attend A Workshop. Too many biofeedback workshops are one-day affairs which just expose one to the field and instruments. Rather, seek out those which provide

(a) extensive contact with counselors who have been offering biofeedback for at least a couple of years, and (b) the opportunity to train on instruments -- not just "hook up", but allow enough time to being to experience feedback training and the relation of internal awarenesses with physiological feedback. Not many workshops offer such.

We offer workshops occasionally, and do consult with a few interested centers. We also refer persons inquiring about workshops to the Executive Secretary of the Biofeedback Research Society (address in Appendix) and to instrument companies (we've used, especially, Autogenic Systems, Inc.), as they have contacts (their informal network) with many persons in the area. Again, getting your own network going will be helpful in hearing of training opportunities.

Train, Yourself, and A Few Select Colleagues and Clients. We feel strongly that any persons doing biofeedback training should train, themselves, with biofeedback instruments before using them with others. By training, we do not mean "hooking up" and practicing a few times. Rather, we mean practice extended over several weeks, allowing one (a) to experience the internal sensations, states and feelings associated with various levels of physiological feedback and (b) applying during the day what is being learned with the instruments. Persons vary in how they respond to and experience biofeedback training. So, we also urge closely monitoring colleagues and a few select clients before extensive use of biofeedback training.

Develop Your Own Applications. We've visited counselors, clinicians and psychiatrists using biofeedback. The most successful seem to us to have several things in common: (1) They seriously have trained with the instruments, and continue to do so, (2) they were, and are, not hesitant to contact experienced persons regarding even the "simpliest" questions, (3) they developed applications of biofeedback which were congruent with their style (rather than mechanically) following some established program), and (4) they are constantly changing and improving their offering.

We've not actively sought outside grant funding, and have been glad we've not done so. A grant "freezes" your procedures for the duration of the project. And this is not the way to begin. Rather, we've found ourselves learning and changing our program over the past four years. We'd encourage you to go slow in committing yourself to a, say, four-year grant during which time you could change your procedures very little. Rather, as soon as you begin you'll see ways to change and improve your biofeedback offerings, and this will continue.

Getting Instruments. We know of no ready source of funds for biofeedback instruments. Both Federal and private foundation grant monies are scarce. Most successful biofeedback practicioners have started by "hustling" for funds. We began by borrowing a digital thermometer and thermister from some engineering colleagues and doing temperature training with it. Also, you might borrow some instrument from a psychology colleague and add some form of feedback to it. We also "talked" six different departments (over 3 years) to contribute a little each ($100-500), plus contributing from our own pockets. If biofeedback really "makes sense" to you, you'll come by monies one way or another.

Be patient. Have fun! And, let us know if you think we might be of help. We'll do our best to respond reasonably promptly.

References

Danskin, D. G. and Walters, E. D. Biofeedback and voluntary self-regulation: counseling and education. Personnel and Guidance Journal, 1973, 51, 633-638.

Danskin, D. G. and Walters, E. D. Biofeedback training as counseling. Counseling and Values, February, 1975.

Green, E. E. and Green, A. M. The ins and outs of mind-body energy. Chapter in 1974 Science Year: The World Book Science Annual. New York: Field Enterprises Educational Corp., 1974, 137-147.

Green, E. E., Green, A. M. and Walters, E. D. Voluntary control of internal states: psychological and physiological. Journal of Transpersonal Psychology, 1970. 2, 1-26.

I. BOOKS

Barber, T. X., et al. (Eds.) Biofeedback and Self-Control. Chicago: Aldine-Atherton, 1971

Barber, T. X., et al. (Eds.) Biofeedback and Self-Control, 1970. Chicago: Aldine-Atherton, 1971

Stoyva, J., et al. (Eds.) Biofeedback and Self-Control, 1971. Chicago: Aldine-Atherton, 1972

Shapiro, D., et al. (Eds.) Biofeedback and Self-Control, 1972. Chicago: Aldine, 1973

Miller, N. E., et al. (Eds.) Biofeedback and Self-Control, 1973. Chicago: Aldine, 1974

An annual series reprinting articles on biofeedback and related procedures. Address: The Aldine Publishing Company
529 South Wabash Avenue
Chicago, Illinois 60605

Birk, L. (Ed.) Biofeedback: Behavioral Medicine. New York: Grune & Stratton, 1973

Brown, B. B. New Mind, New Body. New York: Harper & Row, 1974

II. BIBLIOGRAPHY

Butler, F. and Stoyva, J. Biofeedback and Self-Regulation: A Bibliography. Denver: Biofeedback Research Society and University of Colorado Medical School, 1973

The most comprehensive, up-to-date bibliography available. $4.00 to members of BRS. $6.50 to non-members. See address below.

III. PROFESSIONAL SOCIETY

Biofeedback Research Society
Francine Butler, Executive Secretary
Department of Psychiatry #202
University of Colorado Medical School
4200 East Ninth Avenue
Denver, Colorado 80220

IV. BIOFEEDBACK CONSULTANTS

The Biofeedback Research Society is identifying which of its members would be available for consultation, with some indication of areas of competence. Write Fran Butler, Exec. Sec., at address above.